# Self-Watering Plant Device

Overview: The device makes use of a water level sensor, a moisture level sensor, and a water pump. Using these peripherals the device displays the sensed levels and displays the water level the moisture level. If the sensed values are too low the device sends a signal to the water pump to add more water or if the water has run out it will use a buzzer to signal a low water level.
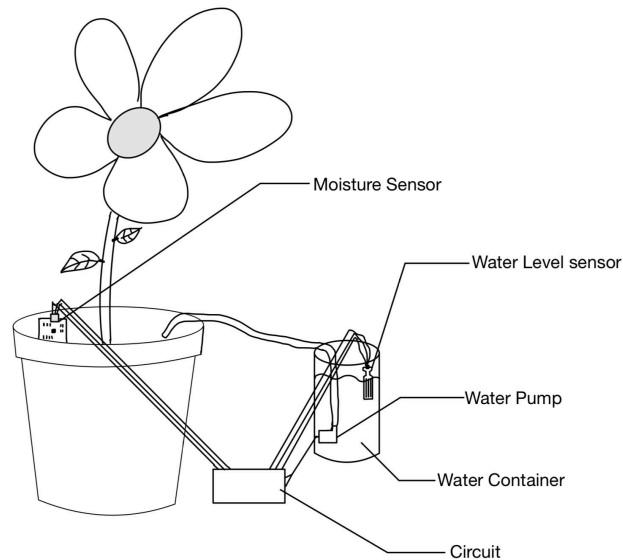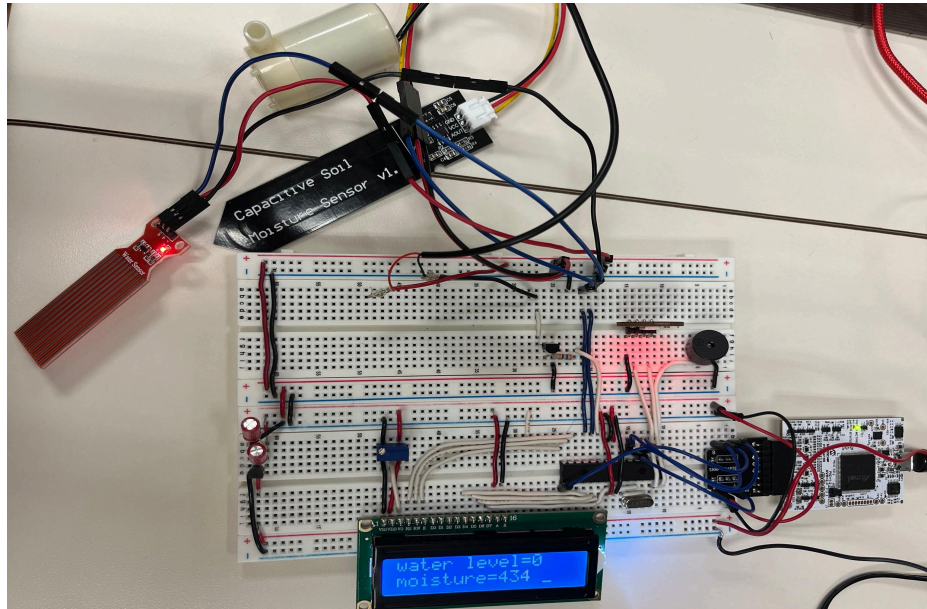
Operating Instructions:

1. Connect power rails to positive and negative with any power supply. Ensure a voltage level of 5V DC which can be obtained by using a variable DC power supply or if using a wall adapter higher than 5V, then use a transformer or a linear voltage regulator to lower the voltage to 5V.

Care:

1. Store electrical components in dry areas

2. Keep within the specified temperature range

Usage:
1. Connect power rails through the power supply (any compatible source of power)
   - Power to red rails and ground to black rails
   - When properly connected, the LCD should turn blue and start displaying water level and moisture level values
2. Insert capacitive soil moisture into soil **(DO NOT INSERT FURTHER THAN WHITE LINE)**
3. Attach water level sensor to side of water container **(DO NOT LET WATER TOUCH ABOVE METAL BARS)**
4. Submerge Water pump into water container (be sure not to drop water on circuit components)
5. Device will operate by itself with the exception of refilling water container
   - When water level goes under **100** buzzer will indicate that more water needs to be added
6. LED will change depending on moisture level
   - Red indicating extremely low moisture
   - Yellow indicating low moisture
   - Green indicating good moisture

Specifications:	
Water Level Sensor Range	0 to 1024
Capacitive Soil Moisture Range	260 to 520
Acceptable Voltage Range for Adapter (V AC @50/60 Hz)	90 to 240
Operating Frequency (MHz)	14.7456 MHz
Working Voltage for Device (V DC)	5
Operating Temperature Range (℃)	10 to 30
Storage Temperature Range (℃)	-20 to 60

Power Consumption (Motor off, Buzzer off)	0.183 Wh
Power Consumption (Motor off, Buzzer on)	0.203 Wh
Power Consumption (Motor on, Buzzer off)	1.310 Wh
Power Consumption (Motor on, Buzzer on)	1.531 Wh

Goal Specifications	Achieved Specifications
Accurate detection of soil moisture (in %)	Accurate detection of soil moisture (in %)
Accurate detection of water level (in %)	Accurate detection of water level (in %)
Display of soil moisture and water depth on LCD (in %)	Display of soil moisture and water depth on LCD (in %)

Use water pump to effectively pump water into pot	Use water pump to pump water into pot with the use of timers in order to allow water to soak in soil
	Use buzzer to indicate low water level
	Use RGB LED to indicated soil moisture (red = dry, yellow = moist, green = very moist)